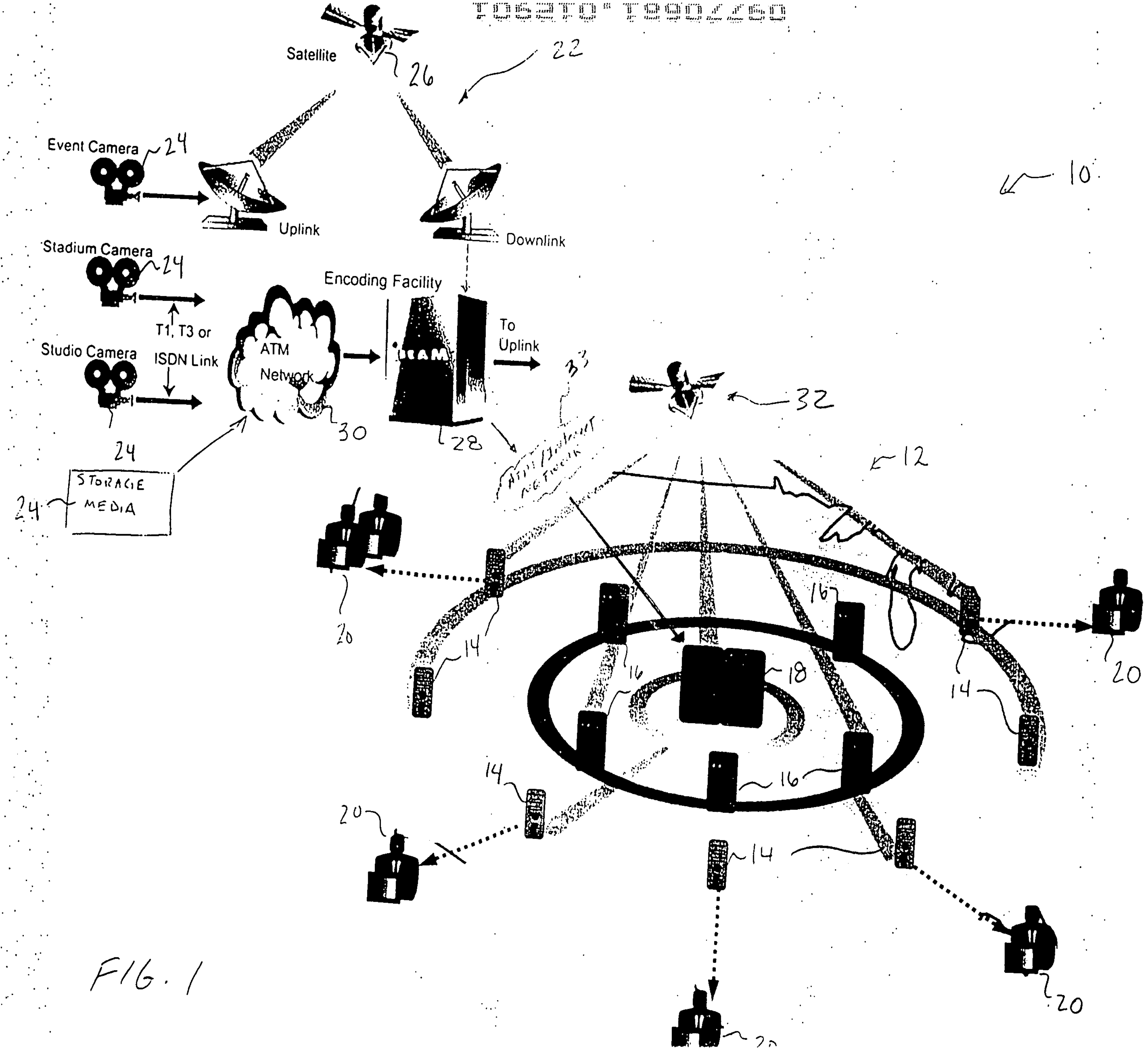

Satellite
26
22
Event Camera
24
Uplink
Downlink
10
Stadium Camera
24
Encoding Facility
T1, T3 or
ISDN Link
Studio Camera
ATM
Network
To
Uplink
30
28
24
33
32
ATM/Internet
NETWORK
12
STORAGE
MEDIA
24
20
14
16
16
18
14
20
14
16
14
16
20
14
20
20

FIG. 1

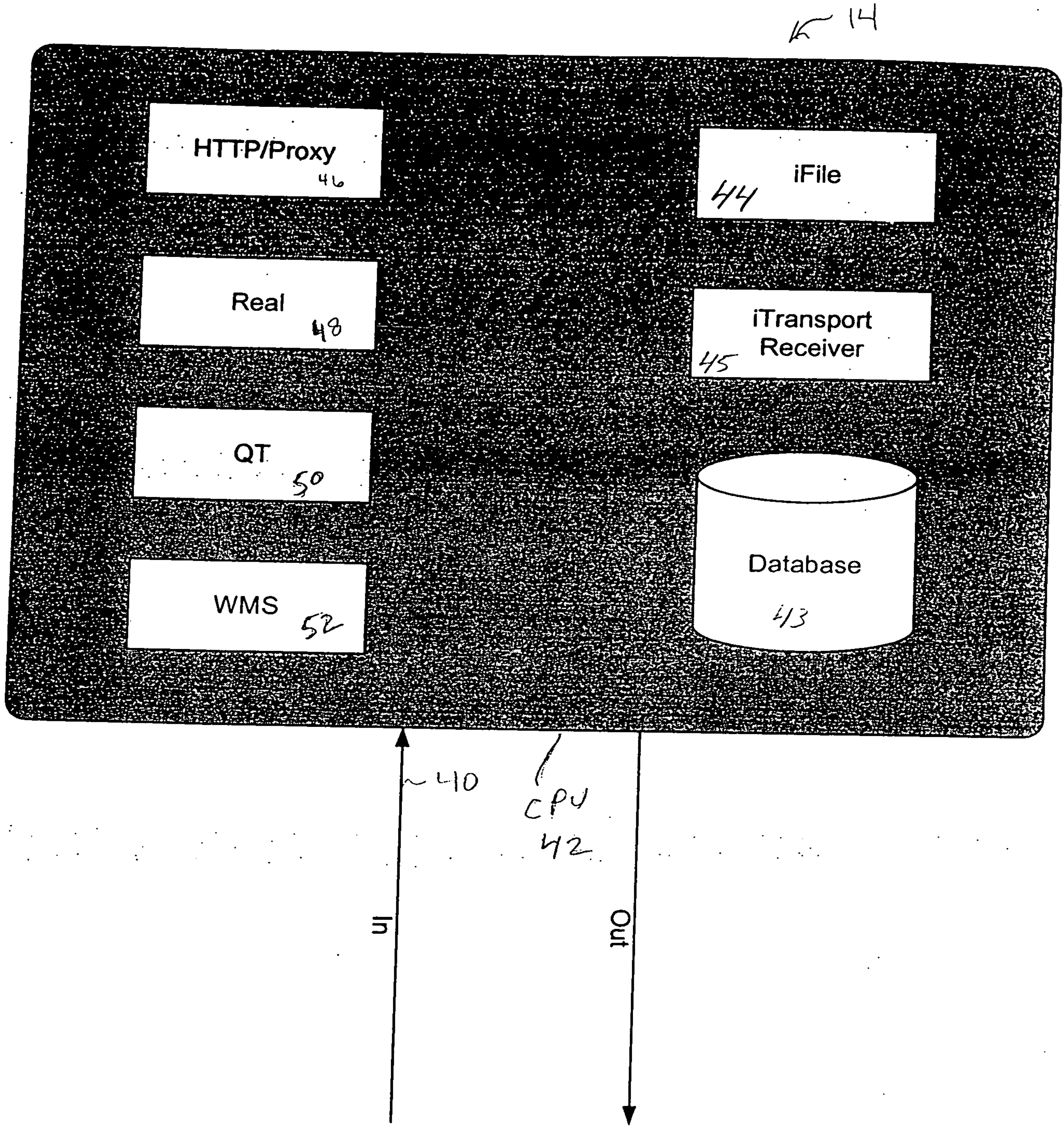

14
HTTP/Proxy
46
Real
48
QT
50
WMS
52
iFile
44
iTransport Receiver
45
Database
43
40
CPU
42
In
Out

FIG. 2

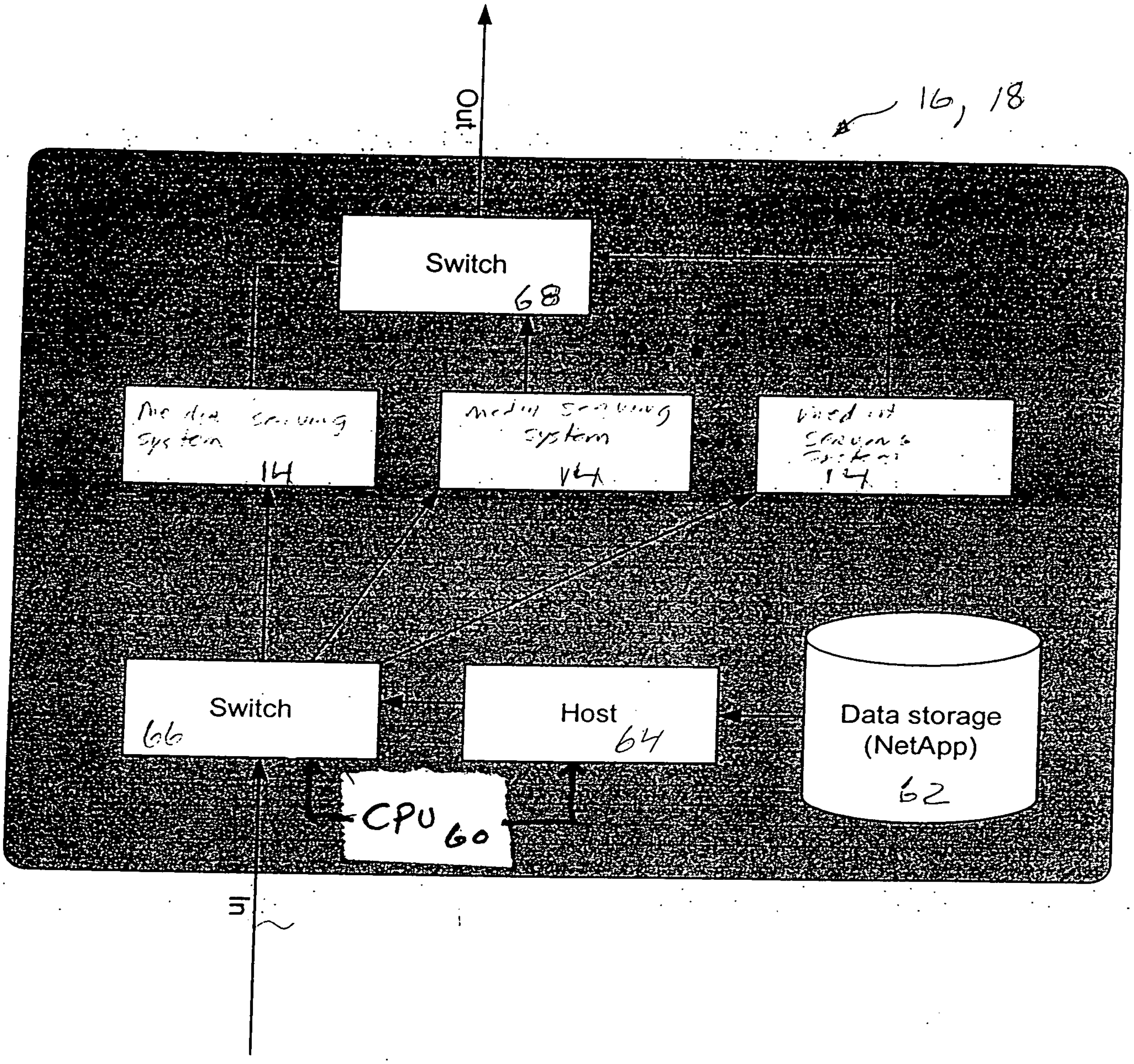

Out
16, 18
Switch
68
Media Serving System
14
media Serving system
14
Video Serving System
14
Switch
66
Host
64
Data storage (NetApp)
62
CPU
60
In

FIG. 3

Data Flow - Local

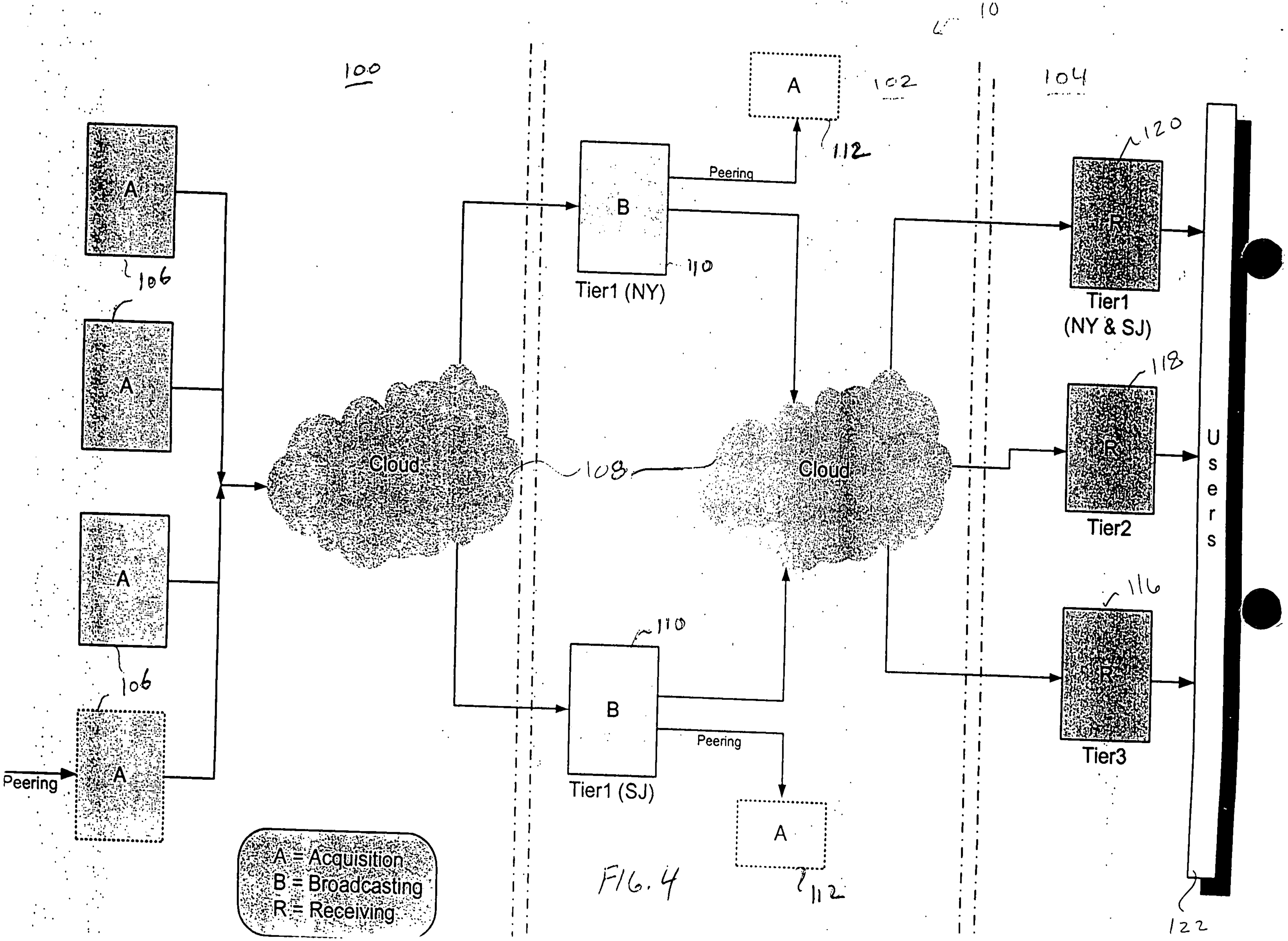


FIG. 4

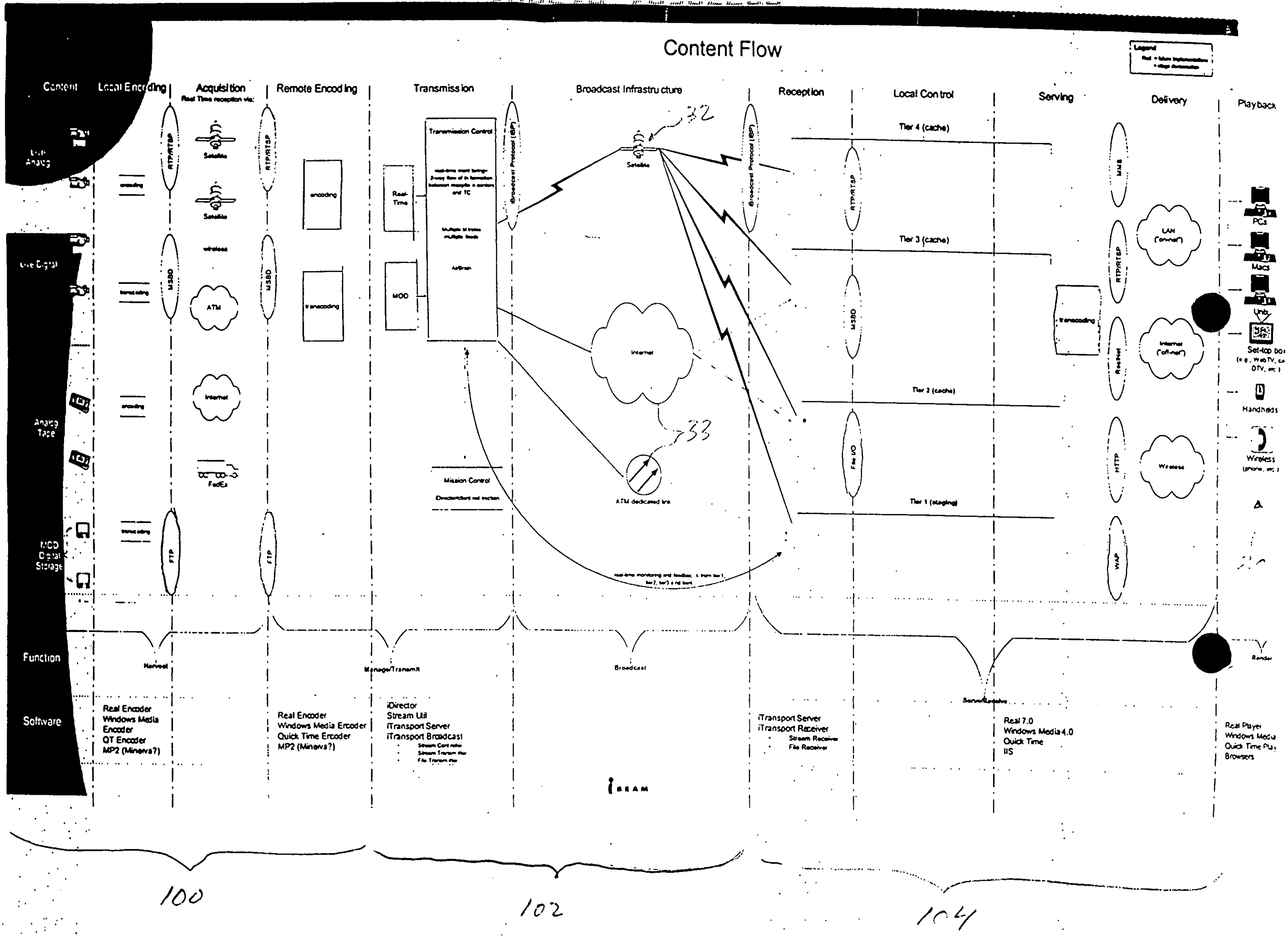

Content Flow
Legend
Content
Live Analog
Live Digital
Analog Tape
MOD Digital Storage
Function
Software
Local Encoding
encoding
transcoding
encoding
transcoding
RTP/RTSP
MSBD
FTP
Acquisition
Real Time reception via:
Satellite
Satellite
wireless
ATM
Internet
FedEx
RTP/RTSP
MSBD
FTP
Remote Encoding
encoding
transcoding
Transmission
Real-Time
MOD
Transmission Control
and TC
AirBrain
Mission Control
iBroadcast Protocol (IBP)
Broadcast Infrastructure
32
Satellite
Internet
33
ATM dedicated link
iBroadcast Protocol (IBP)
Reception
RTP/RTSP
MSBD
File I/O
Local Control
Tier 4 (cache)
Tier 3 (cache)
Tier 2 (cache)
Tier 1 (staging)
Serving
transcoding
MMS
RTP/RTSP
RealNet
HTTP
WAP
Delivery
LAN (on-net)
Internet (off-net)
Wireless
Playback
PCs
Macs
Unix
Set-top box (e.g., WebTV, DTV, etc.)
Handhelds
Wireless (phone, etc.)
Harvest
Manage/Transmit
Broadcast
Serve/Receive
Render
Real Encoder
Windows Media Encoder
QT Encoder
MP2 (Minerva?)
Real Encoder
Windows Media Encoder
Quick Time Encoder
MP2 (Minerva?)
iDirector
Stream Util
iTransport Server
iTransport Broadcast
iBEAM
iTransport Server
iTransport Receiver
Stream Receiver
File Receiver
Real 7.0
Windows Media 4.0
Quick Time
IIS
Real Player
Windows Media
Quick Time Player
Browsers
100
102
104

FIG. 5

Data Flow - Acquisition

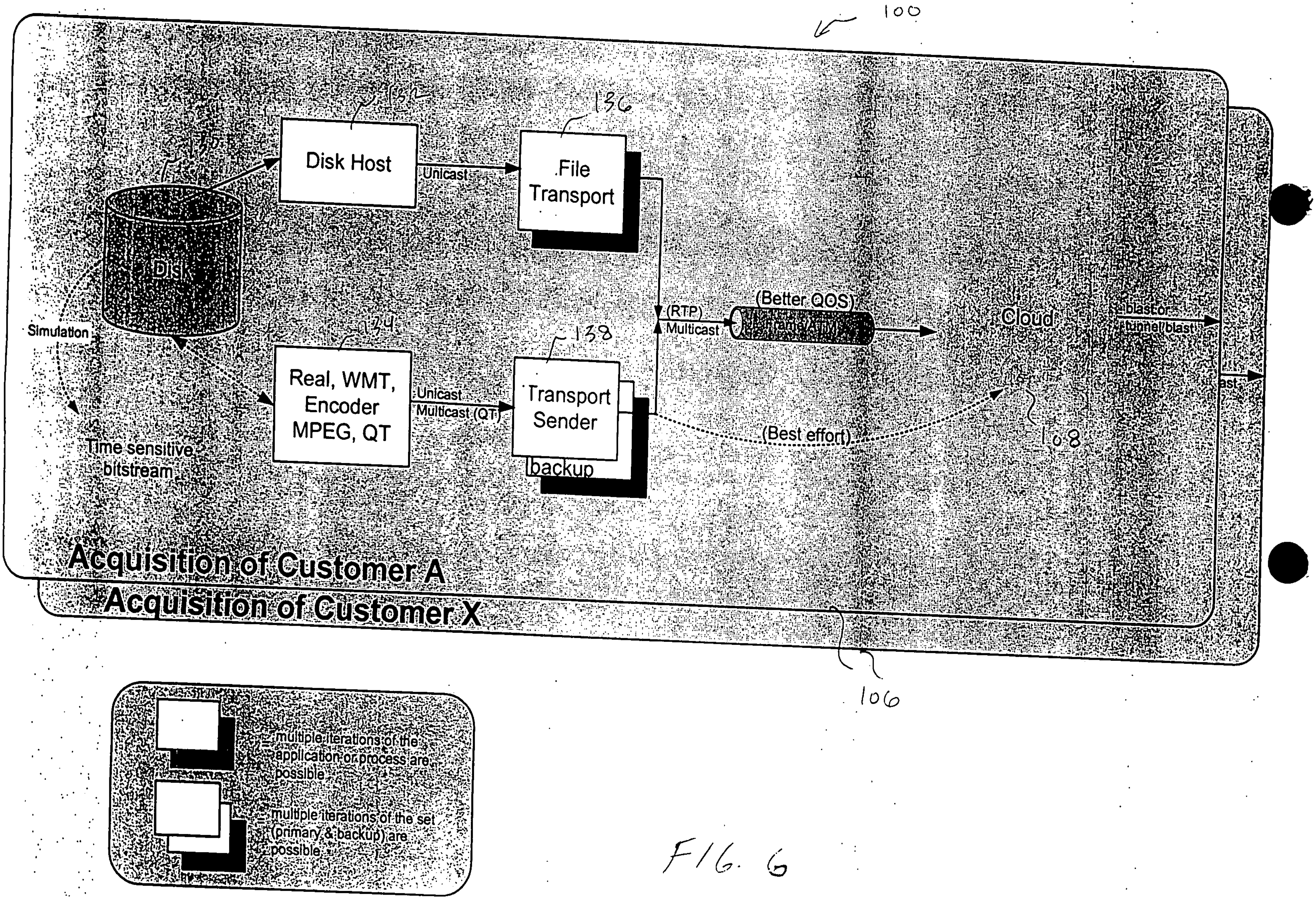


FIG. 6

Data Flow - Broadcasting

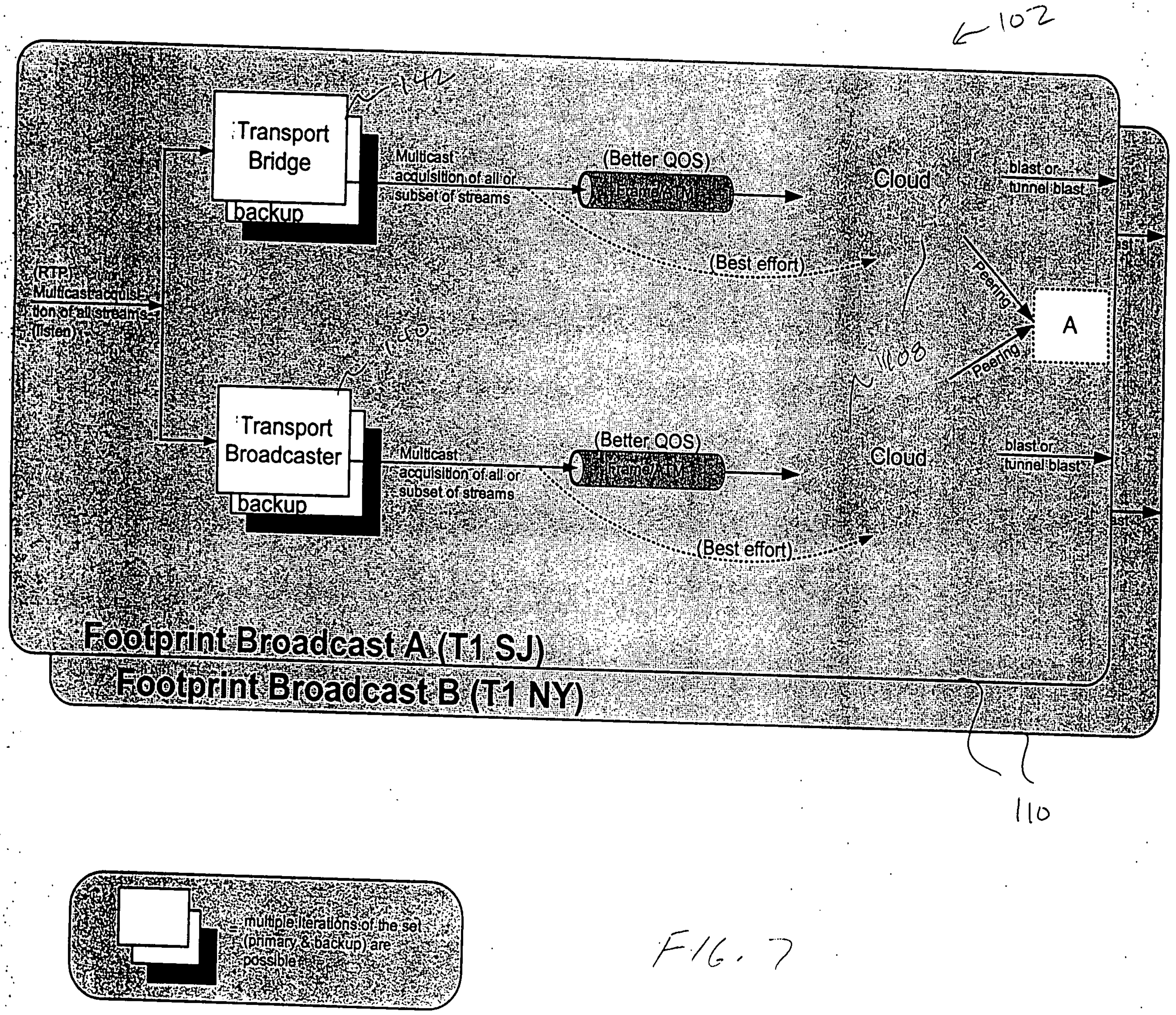


FIG. 7

Data Flow - Reception

P

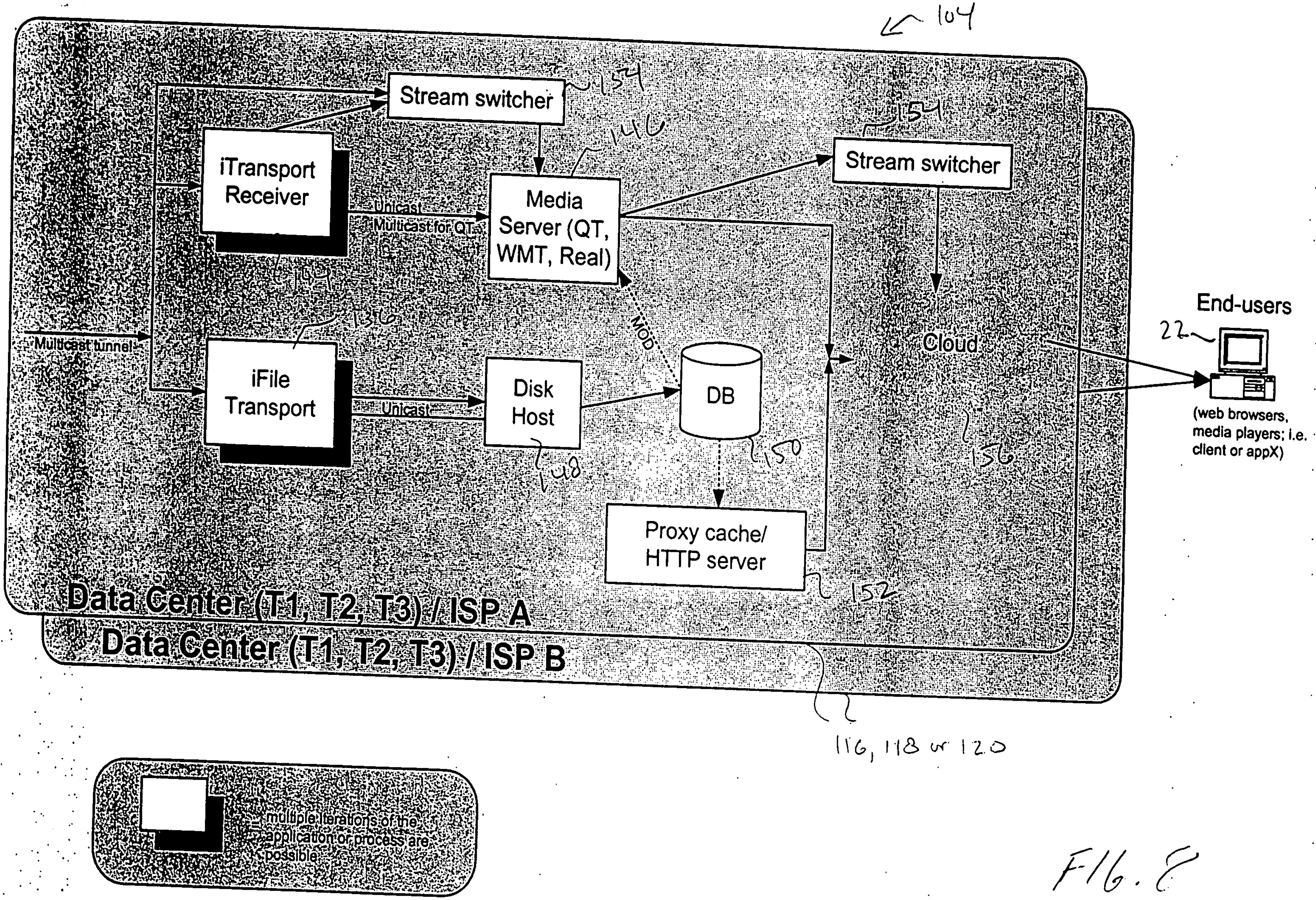


FIG. 8

Abstract Transport Data Management Overview

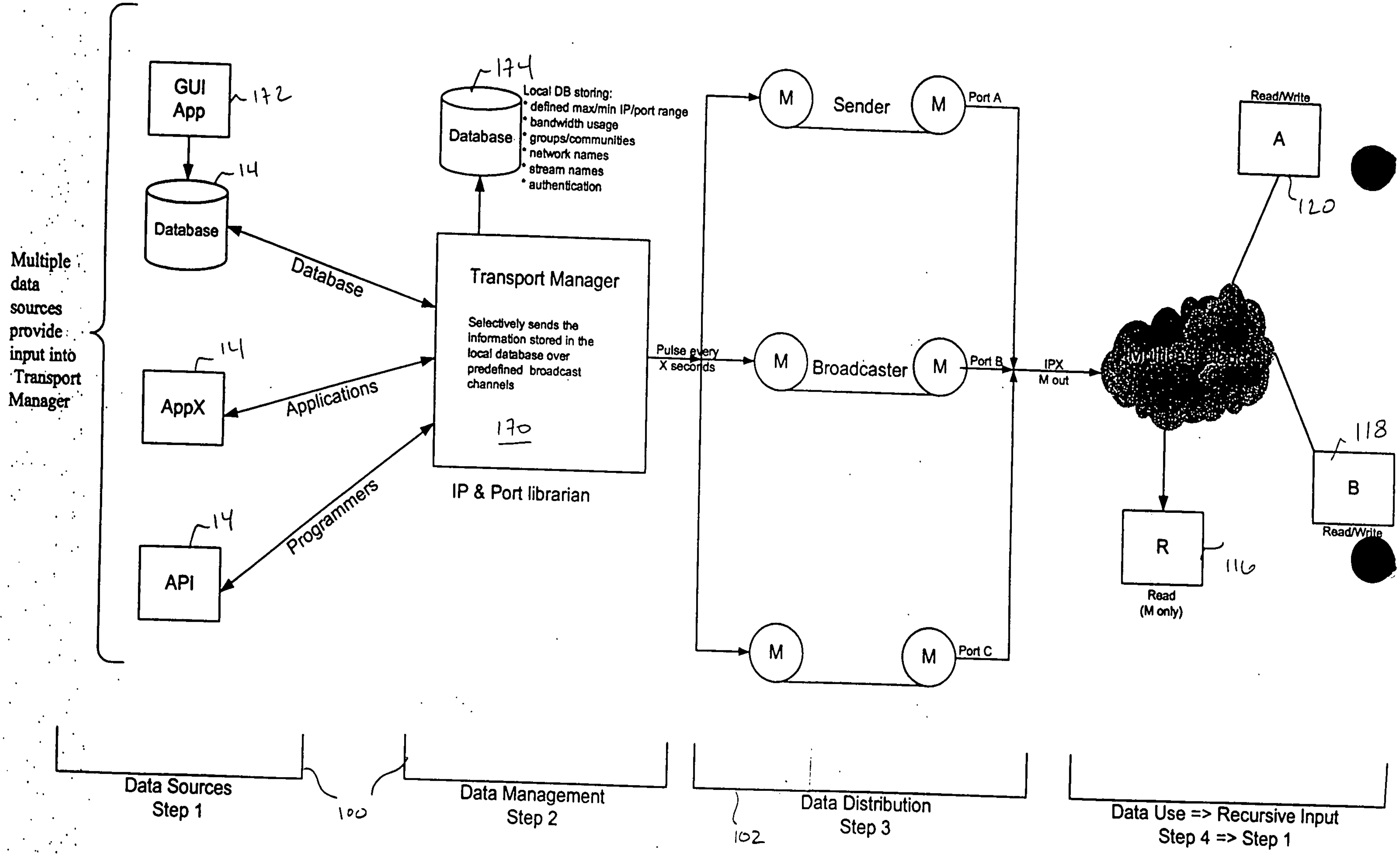
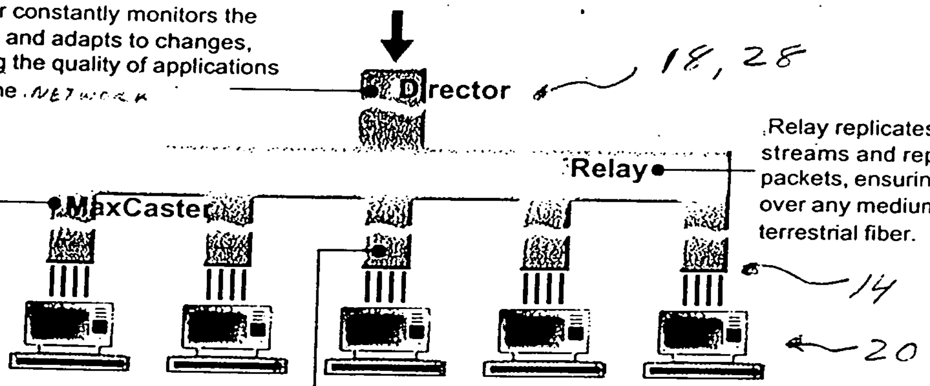


FIG. 9



Director constantly monitors the network and adapts to changes, ensuring the quality of applications run on the NETWORK

Relay replicates content streams and replaces lost packets, ensuring high quality over any medium, satellite, or terrestrial fiber.

The media serving system receives, processes, and delivers data free from the degradation of packet loss.

Serving from the Internet "edge" bypasses congestion, maximizing application quality.

FIG. 10

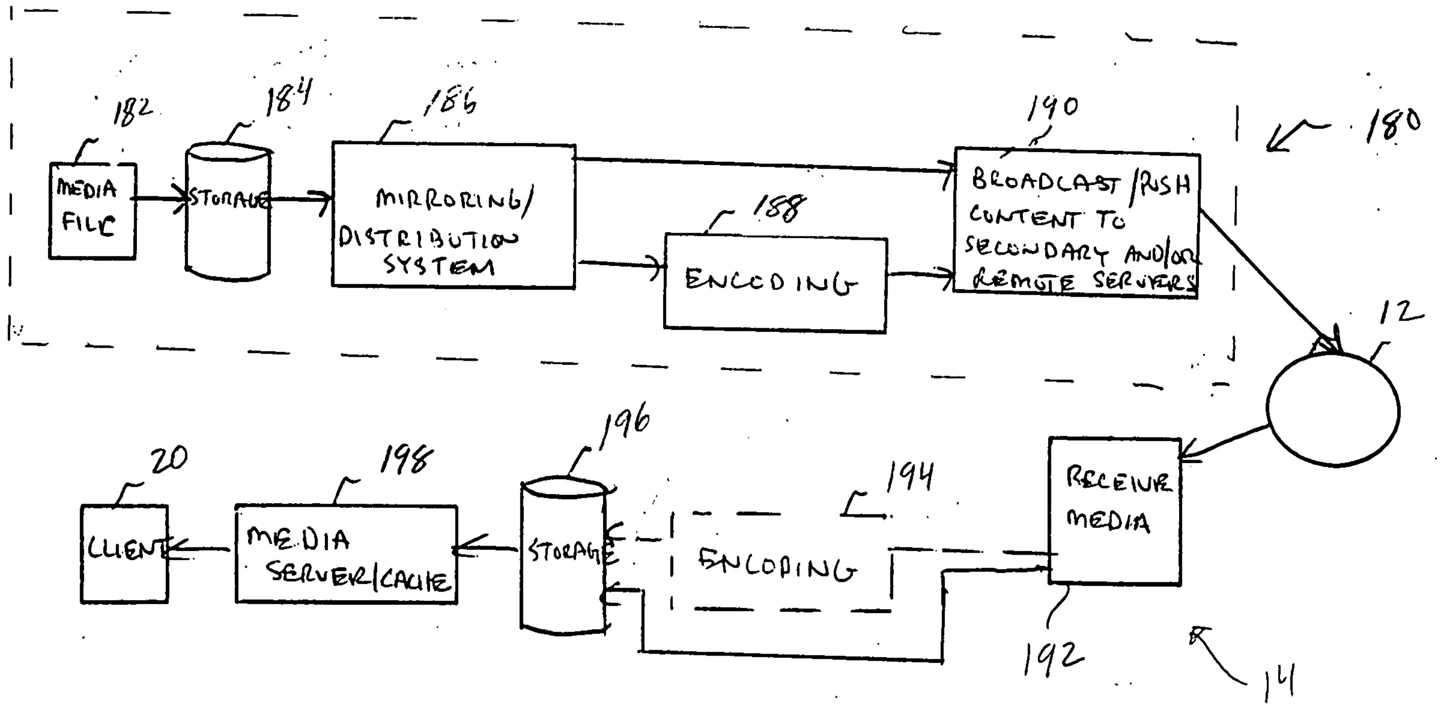

182
MEDIA FILE
184
STORAGE
186
MIRRORING/ DISTRIBUTION SYSTEM
188
ENCODING
190
BROADCAST/PUSH CONTENT TO SECONDARY AND/OR REMOTE SERVERS
180
12
RECEIVE MEDIA
192
14
194
ENCODING
196
STORAGE
198
MEDIA SERVER/CACHE
20
CLIENT

FIG. 11

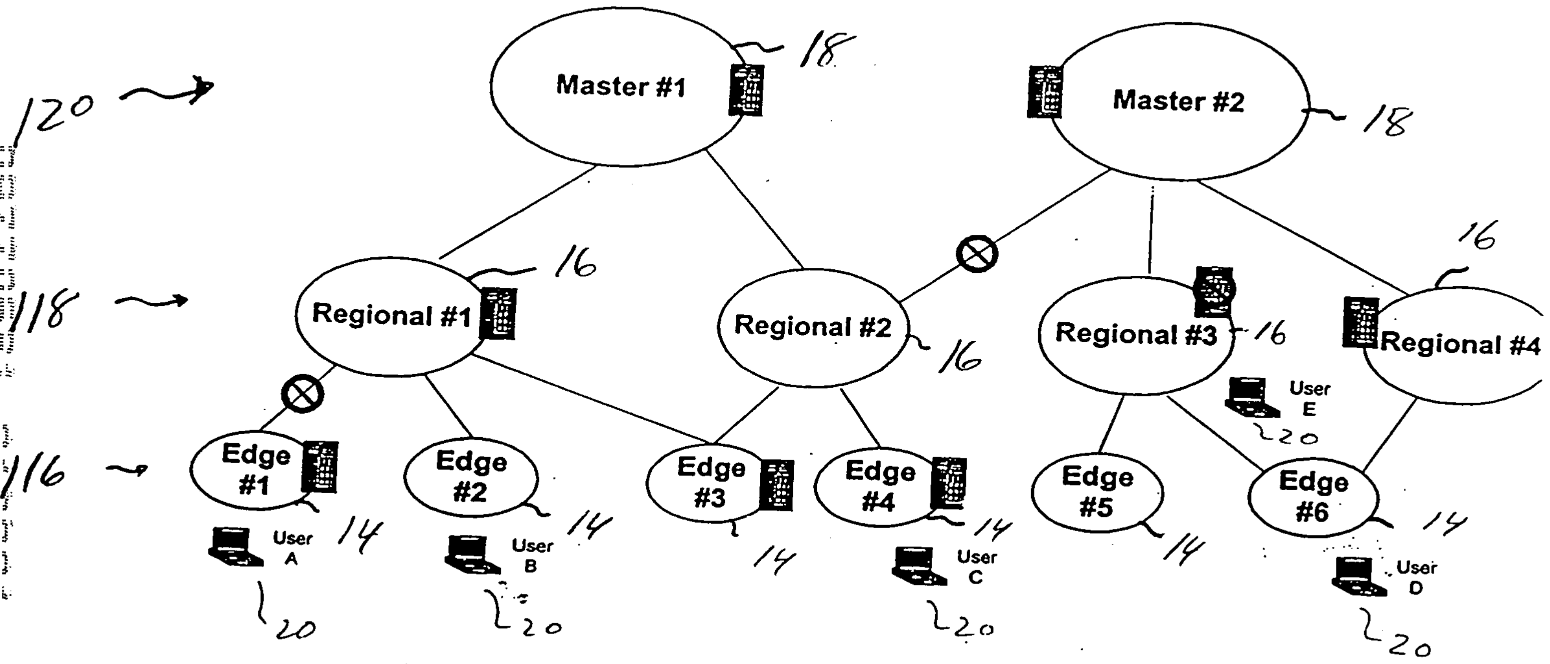

120
118
116
Master #1
18
Master #2
18
Regional #1
16
Regional #2
16
Regional #3
16
Regional #4
16
Edge #1
Edge #2
Edge #3
Edge #4
Edge #5
Edge #6
14
14
14
14
14
14
User A
User B
User C
User D
User E
20
20
20
20
20

FIG. 12